

**APPARATUS FOR ESTABLISHING A PRIORITY CALL
IN A FIXED WIRELESS ACCESS COMMUNICATION SYSTEM**

Inventor(s) :

Paul F. Struhsaker
5304 Brouette Court
Plano
Collin County
Texas 75023
United States Citizen

Assignee:

Raze Technologies, Inc.
2540 East Plano Parkway
Suite 188
Plano, Texas 75074-7460

CERTIFICATE OF EXPRESS MAIL	
I hereby certify that this correspondence, including the attachments listed, is being mailed in an envelope addressed to Commissioner of Patents and Trademarks, Washington, DC 20231, using the Express Mail Post Office to Addressee service of the United States Postal Service on the date shown below.	
<i>Laura Zavah</i> Printed Name of Person Mailing	EL 49593467US Express Mail Receipt No.
<i>Laura Zavah</i> Signature of Person Mailing	Date <u>4-20-0</u>

William A. Munck
John T. Mockler
Novakov Davis & Munck, P.C.
Three Galleria Tower
13155 Noel Road, Suite 900
Dallas, Texas 75240
(214) 922-9221

**APPARATUS FOR ESTABLISHING A PRIORITY CALL
IN A FIXED WIRELESS ACCESS COMMUNICATION SYSTEM**

CROSS-REFERENCE TO RELATED APPLICATIONS

5 The present invention is related to those disclosed in the following United States Provisional and Non-Provisional Patent Applications:

1. Serial No. 09/713,684, filed on November 15, 2000, entitled "SUBSCRIBER INTEGRATED ACCESS DEVICE FOR USE IN WIRELESS AND WIRELINE ACCESS SYSTEMS";
2. [Docket No. WEST14-00005] filed concurrently herewith, entitled "WIRELESS COMMUNICATION SYSTEM USING BLOCK FILTERING AND FAST EQUALIZATION-DEMODULATION AND METHOD OF OPERATION";
3. [Docket No. WEST14-00014], filed concurrently herewith, entitled "APPARATUS AND ASSOCIATED METHOD FOR OPERATING UPON DATA SIGNALS RECEIVED AT A RECEIVING STATION OF A FIXED WIRELESS ACCESS COMMUNICATION SYSTEM";
4. [Docket No. WEST14-00015], filed concurrently herewith, entitled "APPARATUS AND METHOD FOR OPERATING A SUBSCRIBER INTERFACE IN A FIXED WIRELESS SYSTEM";

5. [Docket No. WEST14-00016], filed concurrently herewith,
entitled "APPARATUS AND METHOD FOR CREATING SIGNAL AND
PROFILES AT A RECEIVING STATION";
6. [Docket No. WEST14-00017], filed concurrently herewith,
5 entitled "SYSTEM AND METHOD FOR INTERFACE BETWEEN A SUBSCRIBER
MODEM AND SUBSCRIBER PREMISES INTERFACES";
7. [Docket No. WEST14-00018], filed concurrently herewith,
entitled "BACKPLANE ARCHITECTURE FOR USE IN WIRELESS AND
WIRELINE ACCESS SYSTEMS";
- 10 8. [Docket No. WEST14-00019], filed concurrently herewith,
entitled "SYSTEM AND METHOD FOR ON-LINE INSERTION OF LINE
REPLACEABLE UNITS IN WIRELESS AND WIRELINE ACCESS SYSTEMS";
9. [Docket No. WEST14-00020], filed concurrently herewith,
15 entitled "SYSTEM FOR COORDINATION OF TDD TRANSMISSION BURSTS
WITHIN AND BETWEEN CELLS IN A WIRELESS ACCESS SYSTEM AND
METHOD OF OPERATION";
10. [Docket No. WEST14-00021], filed concurrently herewith,
entitled "REDUNDANT TELECOMMUNICATION SYSTEM USING MEMORY
EQUALIZATION APPARATUS AND METHOD OF OPERATION";
- 20 11. [Docket No. WEST14-00022], filed concurrently herewith,
entitled "WIRELESS ACCESS SYSTEM FOR ALLOCATING AND

SYNCHRONIZING UPLINK AND DOWNLINK OF TDD FRAMES AND METHOD OF OPERATION";

12. [Docket No. WEST14-00023], filed concurrently herewith,
entitled "TDD FDD AIR INTERFACE";

5 13. [Docket No. WEST14-00024], filed concurrently herewith,
entitled "APPARATUS, AND AN ASSOCIATED METHOD, FOR PROVIDING
WLAN SERVICE IN A FIXED WIRELESS ACCESS COMMUNICATION SYSTEM";

14. [Docket No. WEST14-00026], filed concurrently herewith,
entitled "WIRELESS ACCESS SYSTEM USING MULTIPLE MODULATION"];

10 15. [Docket No. WEST14-00027], filed concurrently herewith,
entitled "WIRELESS ACCESS SYSTEM AND ASSOCIATED METHOD USING
MULTIPLE MODULATION FORMATS IN TDD FRAMES ACCORDING TO
SUBSCRIBER SERVICE TYPE";

16. [Docket No. WEST14-00029], filed concurrently herewith,
entitled "APPARATUS FOR REALLOCATING COMMUNICATION RESOURCES
TO ESTABLISH A PRIORITY CALL IN A FIXED WIRELESS ACCESS
COMMUNICATION SYSTEM";

17. [Docket No. WEST14-00030], filed concurrently herewith,
entitled "METHOD FOR ESTABLISHING A PRIORITY CALL IN A FIXED
20 WIRELESS ACCESS COMMUNICATION SYSTEM";

18. [Docket No. WEST14-00033], filed concurrently herewith,
entitled "SYSTEM AND METHOD FOR PROVIDING AN IMPROVED COMMON

CONTROL BUS FOR USE IN ON-LINE INSERTION OF LINE REPLACEABLE UNITS IN WIRELESS AND WIRELINE ACCESS SYSTEMS";

19. Serial No. 60/262,712, filed on January 19, 2001, entitled "WIRELESS COMMUNICATION SYSTEM USING BLOCK FILTERING AND FAST EQUALIZATION-DEMODULATION AND METHOD OF OPERATION" [Docket No. WEST14-00005];
20. Serial No. 60/262,825, filed on January 19, 2001, entitled "APPARATUS AND ASSOCIATED METHOD FOR OPERATING UPON DATA SIGNALS RECEIVED AT A RECEIVING STATION OF A FIXED WIRELESS ACCESS COMMUNICATION SYSTEM" [Docket No. WEST14-00014];
21. Serial No. 60/262,698, filed on January 19, 2001, entitled "APPARATUS AND METHOD FOR OPERATING A SUBSCRIBER INTERFACE IN A FIXED WIRELESS SYSTEM" [Docket No. WEST14-00015];
22. Serial No. 60/262,827, filed on January 19, 2001, entitled "APPARATUS AND METHOD FOR CREATING SIGNAL AND PROFILES AT A RECEIVING STATION" [Docket No. WEST14-00016];
23. Serial No. 60/262,826, filed on January 19, 2001, entitled "SYSTEM AND METHOD FOR INTERFACE BETWEEN A SUBSCRIBER MODEM AND SUBSCRIBER PREMISES INTERFACES" [Docket No. WEST14-00017];
24. Serial No. 60/262,951, filed on January 19, 2001, entitled "BACKPLANE ARCHITECTURE FOR USE IN WIRELESS AND WIRELINE ACCESS SYSTEMS" [Docket No. WEST14-00018];

25. Serial No. 60/262,824, filed on January 19, 2001, entitled "SYSTEM AND METHOD FOR ON-LINE INSERTION OF LINE REPLACEABLE UNITS IN WIRELESS AND WIRELINE ACCESS SYSTEMS" [Docket No. WEST14-00019];
- 5 26. Serial No. 60/263,101, filed on January 19, 2001, entitled "SYSTEM FOR COORDINATION OF TDD TRANSMISSION BURSTS WITHIN AND BETWEEN CELLS IN A WIRELESS ACCESS SYSTEM AND METHOD OF OPERATION" [Docket No. WEST14-00020];
27. Serial No. 60/263,097, filed on January 19, 2001, entitled "REDUNDANT TELECOMMUNICATION SYSTEM USING MEMORY EQUALIZATION APPARATUS AND METHOD OF OPERATION" [Docket No. WEST14-00021];
28. Serial No. 60/273,579, filed March 5, 2001, entitled "WIRELESS ACCESS SYSTEM FOR ALLOCATING AND SYNCHRONIZING UPLINK AND DOWNLINK OF TDD FRAMES AND METHOD OF OPERATION" [Docket No. WEST14-00022];
29. Serial No. 60/262,955, filed January 19, 2001, entitled "TDD FDD AIR INTERFACE" [Docket No. WEST14-00023];
30. Serial No. 60/262,708, filed on January 19, 2001, entitled "APPARATUS, AND AN ASSOCIATED METHOD, FOR PROVIDING WLAN SERVICE IN A FIXED WIRELESS ACCESS COMMUNICATION SYSTEM" [Docket No. WEST14-00024];

31. Serial No. 60/273,689, filed March 5, 2001, entitled "WIRELESS
ACCESS SYSTEM USING MULTIPLE MODULATION" [Docket No. WEST14-
00026];
32. Serial No. 60/273,757, filed March 5, 2001, entitled "WIRELESS
ACCESS SYSTEM AND ASSOCIATED METHOD USING MULTIPLE MODULATION
FORMATS IN TDD FRAMES ACCORDING TO SUBSCRIBER SERVICE TYPE"
[Docket No. WEST14-00027];
- 5 33. Serial No. 60/270,385, filed February 21, 2001, entitled
"APPARATUS FOR REALLOCATING COMMUNICATION RESOURCES TO
ESTABLISH A PRIORITY CALL IN A FIXED WIRELESS ACCESS
COMMUNICATION SYSTEM" [Docket No. WEST14-00029]; and
34. Serial No. 60/270,430, filed February 21, 2001, entitled
"METHOD FOR ESTABLISHING A PRIORITY CALL IN A FIXED WIRELESS
ACCESS COMMUNICATION SYSTEM" [Docket No. WEST14-00030].

110
115
120
125
130
135
140
145
150
155
160
165
170
175
180
185
190
195
200
205
210
215
220
225
230
235
240
245
250
255
260
265
270
275
280
285
290
295
300
305
310
315
320
325
330
335
340
345
350
355
360
365
370
375
380
385
390
395
400
405
410
415
420
425
430
435
440
445
450
455
460
465
470
475
480
485
490
495
500
505
510
515
520
525
530
535
540
545
550
555
560
565
570
575
580
585
590
595
600
605
610
615
620
625
630
635
640
645
650
655
660
665
670
675
680
685
690
695
700
705
710
715
720
725
730
735
740
745
750
755
760
765
770
775
780
785
790
795
800
805
810
815
820
825
830
835
840
845
850
855
860
865
870
875
880
885
890
895
900
905
910
915
920
925
930
935
940
945
950
955
960
965
970
975
980
985
990
995
1000
1005
1010
1015
1020
1025
1030
1035
1040
1045
1050
1055
1060
1065
1070
1075
1080
1085
1090
1095
1100
1105
1110
1115
1120
1125
1130
1135
1140
1145
1150
1155
1160
1165
1170
1175
1180
1185
1190
1195
1200
1205
1210
1215
1220
1225
1230
1235
1240
1245
1250
1255
1260
1265
1270
1275
1280
1285
1290
1295
1300
1305
1310
1315
1320
1325
1330
1335
1340
1345
1350
1355
1360
1365
1370
1375
1380
1385
1390
1395
1400
1405
1410
1415
1420
1425
1430
1435
1440
1445
1450
1455
1460
1465
1470
1475
1480
1485
1490
1495
1500
1505
1510
1515
1520
1525
1530
1535
1540
1545
1550
1555
1560
1565
1570
1575
1580
1585
1590
1595
1600
1605
1610
1615
1620
1625
1630
1635
1640
1645
1650
1655
1660
1665
1670
1675
1680
1685
1690
1695
1700
1705
1710
1715
1720
1725
1730
1735
1740
1745
1750
1755
1760
1765
1770
1775
1780
1785
1790
1795
1800
1805
1810
1815
1820
1825
1830
1835
1840
1845
1850
1855
1860
1865
1870
1875
1880
1885
1890
1895
1900
1905
1910
1915
1920
1925
1930
1935
1940
1945
1950
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
2055
2060
2065
2070
2075
2080
2085
2090
2095
2100
2105
2110
2115
2120
2125
2130
2135
2140
2145
2150
2155
2160
2165
2170
2175
2180
2185
2190
2195
2200
2205
2210
2215
2220
2225
2230
2235
2240
2245
2250
2255
2260
2265
2270
2275
2280
2285
2290
2295
2300
2305
2310
2315
2320
2325
2330
2335
2340
2345
2350
2355
2360
2365
2370
2375
2380
2385
2390
2395
2400
2405
2410
2415
2420
2425
2430
2435
2440
2445
2450
2455
2460
2465
2470
2475
2480
2485
2490
2495
2500
2505
2510
2515
2520
2525
2530
2535
2540
2545
2550
2555
2560
2565
2570
2575
2580
2585
2590
2595
2600
2605
2610
2615
2620
2625
2630
2635
2640
2645
2650
2655
2660
2665
2670
2675
2680
2685
2690
2695
2700
2705
2710
2715
2720
2725
2730
2735
2740
2745
2750
2755
2760
2765
2770
2775
2780
2785
2790
2795
2800
2805
2810
2815
2820
2825
2830
2835
2840
2845
2850
2855
2860
2865
2870
2875
2880
2885
2890
2895
2900
2905
2910
2915
2920
2925
2930
2935
2940
2945
2950
2955
2960
2965
2970
2975
2980
2985
2990
2995
3000
3005
3010
3015
3020
3025
3030
3035
3040
3045
3050
3055
3060
3065
3070
3075
3080
3085
3090
3095
3100
3105
3110
3115
3120
3125
3130
3135
3140
3145
3150
3155
3160
3165
3170
3175
3180
3185
3190
3195
3200
3205
3210
3215
3220
3225
3230
3235
3240
3245
3250
3255
3260
3265
3270
3275
3280
3285
3290
3295
3300
3305
3310
3315
3320
3325
3330
3335
3340
3345
3350
3355
3360
3365
3370
3375
3380
3385
3390
3395
3400
3405
3410
3415
3420
3425
3430
3435
3440
3445
3450
3455
3460
3465
3470
3475
3480
3485
3490
3495
3500
3505
3510
3515
3520
3525
3530
3535
3540
3545
3550
3555
3560
3565
3570
3575
3580
3585
3590
3595
3600
3605
3610
3615
3620
3625
3630
3635
3640
3645
3650
3655
3660
3665
3670
3675
3680
3685
3690
3695
3700
3705
3710
3715
3720
3725
3730
3735
3740
3745
3750
3755
3760
3765
3770
3775
3780
3785
3790
3795
3800
3805
3810
3815
3820
3825
3830
3835
3840
3845
3850
3855
3860
3865
3870
3875
3880
3885
3890
3895
3900
3905
3910
3915
3920
3925
3930
3935
3940
3945
3950
3955
3960
3965
3970
3975
3980
3985
3990
3995
4000
4005
4010
4015
4020
4025
4030
4035
4040
4045
4050
4055
4060
4065
4070
4075
4080
4085
4090
4095
4100
4105
4110
4115
4120
4125
4130
4135
4140
4145
4150
4155
4160
4165
4170
4175
4180
4185
4190
4195
4200
4205
4210
4215
4220
4225
4230
4235
4240
4245
4250
4255
4260
4265
4270
4275
4280
4285
4290
4295
4300
4305
4310
4315
4320
4325
4330
4335
4340
4345
4350
4355
4360
4365
4370
4375
4380
4385
4390
4395
4400
4405
4410
4415
4420
4425
4430
4435
4440
4445
4450
4455
4460
4465
4470
4475
4480
4485
4490
4495
4500
4505
4510
4515
4520
4525
4530
4535
4540
4545
4550
4555
4560
4565
4570
4575
4580
4585
4590
4595
4600
4605
4610
4615
4620
4625
4630
4635
4640
4645
4650
4655
4660
4665
4670
4675
4680
4685
4690
4695
4700
4705
4710
4715
4720
4725
4730
4735
4740
4745
4750
4755
4760
4765
4770
4775
4780
4785
4790
4795
4800
4805
4810
4815
4820
4825
4830
4835
4840
4845
4850
4855
4860
4865
4870
4875
4880
4885
4890
4895
4900
4905
4910
4915
4920
4925
4930
4935
4940
4945
4950
4955
4960
4965
4970
4975
4980
4985
4990
4995
5000
5005
5010
5015
5020
5025
5030
5035
5040
5045
5050
5055
5060
5065
5070
5075
5080
5085
5090
5095
5100
5105
5110
5115
5120
5125
5130
5135
5140
5145
5150
5155
5160
5165
5170
5175
5180
5185
5190
5195
5200
5205
5210
5215
5220
5225
5230
5235
5240
5245
5250
5255
5260
5265
5270
5275
5280
5285
5290
5295
5300
5305
5310
5315
5320
5325
5330
5335
5340
5345
5350
5355
5360
5365
5370
5375
5380
5385
5390
5395
5400
5405
5410
5415
5420
5425
5430
5435
5440
5445
5450
5455
5460
5465
5470
5475
5480
5485
5490
5495
5500
5505
5510
5515
5520
5525
5530
5535
5540
5545
5550
5555
5560
5565
5570
5575
5580
5585
5590
5595
5600
5605
5610
5615
5620
5625
5630
5635
5640
5645
5650
5655
5660
5665
5670
5675
5680
5685
5690
5695
5700
5705
5710
5715
5720
5725
5730
5735
5740
5745
5750
5755
5760
5765
5770
5775
5780
5785
5790
5795
5800
5805
5810
5815
5820
5825
5830
5835
5840
5845
5850
5855
5860
5865
5870
5875
5880
5885
5890
5895
5900
5905
5910
5915
5920
5925
5930
5935
5940
5945
5950
5955
5960
5965
5970
5975
5980
5985
5990
5995
6000
6005
6010
6015
6020
6025
6030
6035
6040
6045
6050
6055
6060
6065
6070
6075
6080
6085
6090
6095
6100
6105
6110
6115
6120
6125
6130
6135
6140
6145
6150
6155
6160
6165
6170
6175
6180
6185
6190
6195
6200
6205
6210
6215
6220
6225
6230
6235
6240
6245
6250
6255
6260
6265
6270
6275
6280
6285
6290
6295
6300
6305
6310
6315
6320
6325
6330
6335
6340
6345
6350
6355
6360
6365
6370
6375
6380
6385
6390
6395
6400
6405
6410
6415
6420
6425
6430
6435
6440
6445
6450
6455
6460
6465
6470
6475
6480
6485
6490
6495
6500
6505
6510
6515
6520
6525
6530
6535
6540
6545
6550
6555
6560
6565
6570
6575
6580
6585
6590
6595
6600
6605
6610
6615
6620
6625
6630
6635
6640
6645
6650
6655
6660
6665
6670
6675
6680
6685
6690
6695
6700
6705
6710
6715
6720
6725
6730
6735
6740
6745
6750
6755
6760
6765
6770
6775
6780
6785
6790
6795
6800
6805
6810
6815
6820
6825
6830
6835
6840
6845
6850
6855
6860
6865
6870
6875
6880
6885
6890
6895
6900
6905
6910
6915
6920
6925
6930
6935
6940
6945
6950
6955
6960
6965
6970
6975
6980
6985
6990
6995
7000
7005
7010
7015
7020
7025
7030
7035
7040
7045
7050
7055
7060
7065
7070
7075
7080
7085
7090
7095
7100
7105
7110
7115
7120
7125
7130
7135
7140
7145
7150
7155
7160
7165
7170
7175
7180
7185
7190
7195
7200
7205
7210
7215
7220
7225
7230
7235
7240
7245
7250
7255
7260
7265
7270
7275
7280
7285
7290
7295
7300
7305
7310
7315
7320
7325
7330
7335
7340
7345
7350
7355
7360
7365
7370
7375
7380
7385
7390
7395
7400
7405
7410
7415
7420
7425
7430
7435
7440
7445
7450
7455
7460
7465
7470
7475
7480
7485
7490
7495
7500
7505
7510
7515
7520
7525
7530
7535
7540
7545
7550
7555
7560
7565
7570
7575
7580
7585
7590
7595
7600
7605
7610
7615
7620
7625
7630
7635
7640
7645
7650
7655
7660
7665
7670
7675
7680
7685
7690
7695
7700
7705
7710
7715
7720
7725
7730
7735
7740
7745
7750
7755
7760
7765
7770
7775
7780
7785
7790
7795
7800
7805
7810
7815
7820
7825
7830
7835
7840
7845
7850
7855
7860
7865
7870
7875
7880
7885
7890
7895
7900
7905
7910
7915
7920
7925
7930
7935
7940
7945
7950
7955
7960
7965
7970
7975
7980
7985
7990
7995
8000
8005
8010
8015
8020
8025
8030
8035
8040
8045
8050
8055
8060
8065
8070
8075
8080
8085
8090
8095
8100
8105
8110
8115
8120
8125
8130
8135
8140
8145
8150
8155
8160
8165
8170
8175
8180
8185
8190
8195
8200
8205
8210
8215
8220
8225
8230
8235
8240
8245
8250
8255
8260
8265
8270
8275
8280
8285
8290
8295
8300
8305
8310
8315
8320
8325
8330
8335
8340
8345
8350
8355
8360
8365
8370
8375
8380
8385
8390
8395
8400
8405
8410
8415
8420
8425
8430
8435
8440
8445
8450
8455
8460
8465
8470
8475
8480
8485
8490
8495
8500
8505
8510
8515
8520
8525
8530
8535
8540
8545
8550
8555
8560
8565
8570
8575
8580
8585
8590
8595
8600
8605
8610
8615
8620
8625
8630
8635
8640
8645
8650
8655
8660
8665
8670
8675
8680
8685
8690
8695
8700
8705
8710
8715
8720
8725
8730
8735
8740
8745
8750
8755
8760
8765
8770
8775
8780
8785
8790
8795
8800
8805
8810
8815
8820
8825
8830
8835
8840
8845
8850
8855
8860
8865
8870
8875
8880
8885
8890
8895
8900
8905
8910
8915
8920
8925
8930
8935
8940
8945
8950
8955
8960
8965
8970
8975
8980
8985
8990
8995
9000
9005
9010
9015
9020
9025
9030
9035
9040
9045
9050
9055
9060
9065
9070
9075
9080
9085
9090
9095
9100
9105
9110
9115
9120
9125
9130
9135
9140
9145
9150
9155
9160
9165
9170
9175
9180
9185
9190
9195
9200
9205
9210
9215
9220
9225
9230
9235
9240
9245
9250
9255
9260
9265
9270
9275
9280
9285
9290
9295
9300
9305
9310
9315
9320
9325
9330
9335
9340
9345
9350
9355
9360
936

TECHNICAL FIELD OF THE INVENTION

The present invention relates generally to a manner by which to initiate establishment of a priority call, such as a call to request emergency assistance in a FWA (fixed wireless access), or 5 other, communication system. More particularly, the present invention relates to apparatus, and an associated method, by which to effectuate the priority call even when communication resources are not initially available to establish the call. The initial unavailability of the communication resources is not made known to 10 the user initiating the call as normal system operation is emulated at a subscriber station from which the call originates. And, when the call is determined to be a priority call, the communication resources of the communication system are reallocated to provide 15 communication resources to permit the establishment of the priority call.

BACKGROUND OF THE INVENTION

Telecommunications access systems provide for voice, data, and multimedia transport and control between the central office (CO) of the telecommunications service provider and the subscriber 20 (customer) premises. Prior to the mid-1970s, the subscriber was provided phone lines (e.g., voice frequency (VF) pairs) directly

from the Class 5 switching equipment located in the central office of the telephone company. In the late 1970s, digital loop carrier (DLC) equipment was added to the telecommunications access architecture. The DLC equipment provided an analog phone interface, voice CODEC, digital data multiplexing, transmission interface, and control and alarm remotely from the central office to cabinets located within business and residential locations for approximately 100 to 2000 phone line interfaces. This distributed access architecture greatly reduced line lengths to the subscriber and resulted in significant savings in both wire installation and maintenance. The reduced line lengths also improved communication performance on the line provided to the subscriber.

By the late 1980s, the limitations of data modem connections over voice frequency (VF) pairs were becoming obvious to both subscribers and telecommunications service providers. ISDN (Integrated Services Digital Network) was introduced to provide universal 128 kbps service in the access network. The subscriber interface is based on 64 kbps digitization of the VF pair for digital multiplexing into high speed digital transmission streams (e.g., T1/T3 lines in North America, E1/E3 lines in Europe). ISDN was a logical extension of the digital network that had evolved throughout the 1980s. The rollout of ISDN in Europe was highly

successful. However, the rollout in the United States was not successful, due in part to artificially high tariff costs which greatly inhibited the acceptance of ISDN.

More recently, the explosion of the Internet and deregulation 5 of the telecommunications industry have brought about a broadband revolution characterized by greatly increased demands for both voice and data services and greatly reduced costs due to technological innovation and intense competition in the telecommunications marketplace. To meet these demands, high speed 10 DSL (digital subscriber line) modems and cable modems have been developed and introduced. The DLC architecture was extended to provide remote distributed deployment at the neighborhood cabinet level using DSL access multiplexer (DSLAM) equipment. The increased data rates provided to the subscriber resulted in upgrade 15 DLC/DSLAM transmission interfaces from T1/E1 interfaces (1.5/2.0 Mbps) to high speed DS3 and OC3 interfaces. In a similar fashion, the entire telecommunications network backbone has undergone and is undergoing continuous upgrade to wideband optical transmission and switching equipment.

20 Similarly, wireless access systems have been developed and deployed to provide broadband access to both commercial and residential subscriber premises. Initially, the market for

wireless access systems was driven by rural radiotelephony deployed solely to meet the universal service requirements imposed by government (i.e., the local telephone company is required to serve all subscribers regardless of the cost to install service). The 5 cost of providing a wired connection to a small percentage of rural subscribers was high enough to justify the development and expense of small-capacity wireless local loop (WLL) systems.

Deregulation of the local telephone market in the United States (e.g., Telecommunications Act of 1996) and in other countries shifted the focus of fixed wireless access (FWA) systems deployment from rural access to competitive local access in more urbanized areas. In addition, the age and inaccessibility of much of the older wired telephone infrastructure makes FWA systems a cost-effective alternative to installing new, wired infrastructure.

Also, it is more economically feasible to install FWA systems in developing countries where the market penetration is limited (i.e., the number and density of users who can afford to pay for services is limited to small percent of the population) and the rollout of wired infrastructure cannot be performed profitably. In either 20 case, broad acceptance of FWA systems requires that the voice and data quality of FWA systems must meet or exceed the performance of wired infrastructure.

Wireless access systems must address a number of unique operational and technical issues including:

- 1) Relatively high bit error rates (BER) compared to wire line or optical systems; and
- 5 2) Transparent operation with network protocols and protocol time constraints for the following protocols:
 - a) ATM;
 - b) Class 5 switch interfaces (domestic GR-303 and international V5.2);
 - c) TCP/IP with quality-of-service QoS for voice over IP (VoIP) (i.e., RTP) and other H.323 media services;
 - d) Distribution of synchronization of network time out to the subscribers;
- 15 3) Increased use of voice, video and/or media compression and concentration of active traffic over the air interface to conserve bandwidth;
- 4) Switching and routing within the access system to distribute signals from the central office to multiple remote cell sites containing multiple cell sectors and one or more frequencies of operation per sector; and
- 20 5) Remote support and debugging of the subscriber equipment,

including remote software upgrade and provisioning.

Unlike physical optical or wire systems that operate at bit error rates (BER) of 10^{-11} , wireless access systems have time varying channels that typically provide bit error rates of 10^{-3} to 10^{-6} . The wireless physical (PHY) layer interface and the media access control (MAC) layer interface must provide modulation, error correction and ARQ protocol that can detect and, where required, correct or retransmit corrupted data so that the interfaces at the network and at the subscriber site operate at wire line bit error rates.

The wide range of equipment and technology capable of providing either wireline (i.e., cable, DSL, optical) broadband access or wireless broadband access has allowed service providers to match the needs of a subscriber with a suitable broadband access solution. However, in many areas, the cost of cable modem or DSL service is high. Additionally, data rates may be slow or coverage incomplete due to line lengths. In these areas and in areas where the high cost of replacing old telephone equipment or the low density of subscribers makes it economically unfeasible to introduce either DSL or cable modem broadband access, fixed wireless broadband systems offer a viable alternative. Fixed wireless broadband systems use a group of transceiver base stations

to cover a region in the same manner as the base stations of a cellular phone system. The base stations of a fixed wireless broadband system transmit forward channel (i.e., downstream) signals in directed beams to fixed location antennas attached to 5 the residences or offices of subscribers. The base stations also receive reverse channel (i.e., upstream) signals transmitted by the broadband access equipment of the subscriber.

Unfortunately, the diversity of broadband access technology has resulted in a lack of standardization in the broadband access equipment. Cable modems and DSL routers are incompatible with each other and with fiber optic equipment. Different service providers locate broadband access equipment in different locations on the subscriber premises. Often this equipment is located inside the office or residence of the subscriber, which makes it inaccessible to maintenance workers unless the subscriber is present to admit the workers to the premises. The lack of standardization of broadband access equipment and the frequent inaccessibility of such equipment adds to the cost and complexity of broadband access.

Therefore, there is a need in the art for broadband access 20 equipment that can be readily and inexpensively deployed in the large domestic and international markets that are not currently served by wired or wireless broadband access technology. Further,

there is a need for an apparatus to increase the communication capacity of the communication system.

Concentration techniques are utilized in construction of many multi-user communication systems. Concentration techniques, 5 generally, refer to selection of the number of users permitted to be part of the system to be greater, by some factor, than the actual capacity of the communication system. Statistical, or other, analysis is made of the likely number of users of the communication system at any particular time, and the system is constructed to support a number of users based upon the expected number of users.

During times in which actual usage of the communication exceeds the capacity of the system, additional users, beyond the system's capacity, are prevented, or blocked, from access to the system.

When the communication system comprises a conventional wireline, telephonic communication system, the additional users are provided indication of their failure to access the system by alerting such users with audible alerts. The audible alerts are 20 audibly distinct from normal dial tones generated during normal telephonic operation.

In a fixed wireless access communication system, capacity

limitations are possible between both the network infrastructure of the system and a correspondent node forming a terminating or originating station as well as, additionally, the radio links extending between the network infrastructure and the subscriber stations.

When, for instance, a user at the subscriber station needs to place a priority call, such as a request for emergency assistance to an emergency dispatch center, access to the communication system to communicate with the emergency dispatch center is essential. A need therefore exists to provide access to a communication system to establish the priority call with the emergency dispatch center. It would also be desirable to provide a manner by which to operate the communication system in which the user is not made aware of an initial blockage from access to the system if access shall subsequently be granted.

It is in light of this background information related to radio communication systems that the significant improvements of the present invention have evolved.

SUMMARY OF THE INVENTION

The present invention, accordingly, advantageously provides apparatus, and an associated method, by which to initiate establishment of a priority call, such as a call to request 5 emergency assistance, in a FWA (fixed wireless access), or other, communication system.

Through operation of an embodiment of the present invention, a manner is provided by which to effectuate the priority call even when the communication resources are not initially available to establish the call.

When a call is initiated, the initial unavailability of the communication resources is not made known to the user initiating the call as normal system operation is emulated at the subscriber station at which the call is originated. The communication resources of the communication system are reallocated, when the call is determined to be a priority call, to provide communication resources to permit the establishment of the priority call.

In one aspect of the present invention, apparatus is provided for a subscriber station operable in a fixed wireless access 20 communication system. When a priority call is originated at the subscriber station, the user of the subscriber station takes the telephonic station located thereat off-hook. When the telephonic

station is off-hook, a call establishment message is generated and sent by way of a radio link to network infrastructure of the fixed wireless access system. The establishment message is generated as a precursor to a request to establish the call between the 5 subscriber station and another communication station. Detection is made at the network infrastructure of the call establishment message. Responsive thereto, determination is made of the communication resource availability in the communication system to establish an additional call, of indeterminate priority. A response indicating whether communication resources are available in the communication system to establish the call of indeterminate priority is returned to the subscriber station.

A response detector at the subscriber station is coupled to receive indications of the response to the call establishment message. Indication of whether communication resources are available to establish the call is detected thereat. If communication resources are unavailable, a call set-up emulator is operable to emulate at the subscriber station normal call set-up operations. To the user of the subscriber station at which the 20 call is initiated, call set-up operations appear to be normally progressing.

Dialing digits associated with the terminating station with

which the call is to be established are entered at the subscriber station. A dialing digit signal is then sent to the network infrastructure. Determination is made at the network infrastructure of the priority to be associated with the call which is to be established. If the call is a priority call, such as a call to an emergency dispatch center, e.g., indicated by a pseudo-universal dialing code, such as 9-1-1, resource reallocations are effectuated to permit the establishment of the call. Thereafter, the call is established.

In one implementation, apparatus is provided for a subscriber station operable in the FWA system. A call set-up emulator is selectively operable to emulate normal call set-up operations at the subscriber station even when communication resources are not initially available to establish a call by the subscriber station. A dial-tone generator generates a dial tone audibly detectable by the user of the subscriber station in which the call is originated. Dialing digits associated with the call originated at the subscriber station are also enterable in apparent normal fashion at the subscriber station. Upon subsequent reallocation of communication resources in the FWA communication system, the call establishment commences in normal manner.

In a further implementation, apparatus is provided for the

network infrastructure of the FWA system, such as at an access processor or base transceiver station of the system. A detector is coupled to detect a call establishment message transmitted to the network infrastructure. Responsive to receipt of the call 5 establishment message, determinations are made of the availability of communication resources to establish a call in the communication system. A response is then sent to the originating subscriber station. Thereafter, indications of the identity of the terminating station to which a call is to be established are received at the network infrastructure. If the identify of the terminating station indicates that the call is a priority call, reallocation of communication resources is made, if necessary, to permit the establishment of the call. If communication resources are not otherwise available, an ongoing communication session is terminated to provide the communication resources to effectuate the 15 call.

In these and another aspects, therefore, apparatus, and an associated method, is provided for a multi-user FWA (fixed wireless access) communication system in which a plurality of subscriber stations are operable to communicate by way of radio links with network infrastructure to which a correspondent node is coupled. A 20 call of a selected call-type is selectively originated at a selected

subscriber station. A call establishment message generator is coupled to receive an indication of initiation at the selected subscriber station of origination of the call. The call establishment message generator generates a call establishment message for communication to the network infrastructure to initiate call set-up procedures which precurse a request to establish the call between the selected subscriber station and the correspondent node. A response detector is coupled to receive an indication of a network-infrastructure generated to respond to the call establishment message generated by the call establishment message generator. The response detector detects whether the response to the call establishment indicates communication resources to be available to establish the call. A call set-up emulator is coupled to the response detector. The call set-up emulator is operable to emulate at the selected subscriber station normal call set-up operations thereat. The normal call set-up operations are emulated for a selected period responsive to detection by the response detector of unavailability of the communication resources to establish the priority call.

The present invention will be better understood when read in light of the accompanying drawings which are described in the detailed description hereinbelow and in light of the claims appended hereto.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 illustrates a functional block diagram of an exemplary fixed wireless access (FWA) network in which an embodiment of the present invention is operable.

5 Figure 2 illustrates an exemplary data frame, as defined by the fixed wireless access network in Figure 1, according to an embodiment of the present invention;

Figure 3 illustrates a functional block diagram of portions of the fixed wireless access communication system shown in Figure 1.

10 Figure 4 illustrates a message sequence diagram exemplary of signaling generated during operation of the communication system shown in Figures 1 and 3 pursuant to an embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

Referring first to Figure 1, a communication system, shown generally at 10, provides for communications with the subscriber stations, of which the subscriber station 12 is exemplary.

5 Communications are effectuated with the subscriber station by way of radio links formed upon an air interface 14. Data originated at an appropriately-positioned subscriber station can be communicated to a correspondent node, 16 by way of a communication path by way of the radio links formed upon the air interface. Data originated at the correspondent node 16 can be communicated upon a communication path formed between a correspondent node and a subscriber station. Two-way communication between the subscriber station and the correspondent node is thereby possible.

In the exemplary implementation, the communication system 10 forms a fixed wireless access (FWA) system coupled to a network backbone, of which the combined path data network (PDN) and public-switched telephonic network (PSTN) 18 is representative in the figure.

While the following description of operation of an embodiment 20 of the present invention shall describe its operation with respect to the exemplary implementation of the communication system shown in the figure, it should be understood that operation of an

embodiment of the present invention is analogously also operable in other types of communication systems which use concentration techniques or otherwise are susceptible to access limitations.

The fixed wireless access system includes a plurality of base transceiver stations of which the base transceiver/remote modem (BTS/RM) 22 shown in the figure is exemplary. Each base transceiver station defines a cell. Here, the base transceiver station 22 defines a cell 24. The subscriber station 12 is here positioned at a location encompassed by the cell 24. A plurality of other subscriber stations are also positionable at locations encompassed by the cell 24. And, other subscriber stations positioned in other cells defined by other base transceiver stations typically form parts of a fixed wireless access communication system.

Concentration techniques are used in system construction. That is to say, system construction permits a high ratio of subscriber stations to base transceiver stations such that, if all of the subscriber stations simultaneously attempt to effectuate communication sessions, the communication capacity of the base transceiver stations would be exceeded. Through the use of concentration techniques, a statistical, or other, determination is made of an appropriate number of subscriber stations to be

permitted to be associated with a particular base transceiver station. Not all of the subscriber stations are likely to attempt to effectuate simultaneous communication sessions, thereby permitting the number of permitted subscriber stations to be
5 increased.

While any of the a large variety of different types of communications are effectuable, of significance to an embodiment of the present invention are telephonic communications originated at the subscriber station. A telephonic station 26 is here shown to be located at the subscriber station 12.

Use of the terminology communications by the subscriber station and by the telephonic station shall be used, at times, interchangeably below to indicate communications by the telephonic station with the correspondent node 16. And, while only a telephonic station 26 is shown to be positioned at the subscriber station, other types of communication devices such as computer stations and consumer-electronic devices, can also be represented at the subscriber station.

An integrated access device (IAD) 28 is also shown to be
20 positioned at the subscriber station. The integrated access device (IAD) unit includes transceiver circuitry capable of communicating by way of the air interface with the base transceiver station 22.

The telephonic station 26 is coupled to the integrated access device 28 and communications are effectuated with the subscriber station by way of the integrated access device.

The base transceiver station 22 forms a portion of the network 5 infrastructure of the fixed wireless access system. Groups of base transceiver stations are coupled to an access processor (AP) 32. And, in turn, the access process is coupled to the network 18. During operation of an embodiment of the present invention, communication resources required to establish a call between the telephonic station 26 and the correspondent node 16 are selectively provided. Communication resources both at the air interface 14 and through the network 18 must be available to establish the call between the telephonic station 26 and the correspondent node 16.

Figure 2 illustrates portions of the communication system 10 to illustrate operation of an embodiment of the present invention.

Operation of an embodiment of the present invention permits a user of the telephonic station 26 positioned at the subscriber station 12 to originate a call to an emergency dispatch center 34 at which the correspondent node 16 is located.

Elements shown in the figure are functional representations, portions of which are implemented, in exemplary implementation, as algorithms executable at processing devices. Additionally,

functional operation of the various elements, or portions thereof, can be distributed at several locations or elements of the communication system. Here, for instance, the transmit and receive circuitry portions 36 and 38 are implemented at the integrated 5 access device 28, at the telephonic station 26, or at other portions of the subscriber stations.

When a call is placed to the emergency dispatch center, a pseudo-universal dialing code, such as a 9-1-1 dialing code is entered at the telephonic station of the subscriber station.

A user interface 42 is also positioned at the subscriber station. The user interface includes, for instance, an actuation key pad located on the telephonic station which permits user actuation thereof to enter dialing digits associated with a terminating station such as the correspondent node 16 at the emergency dispatch center 34. The user interface is also representative of a hook switch associated with the telephonic station upon which a telephonic handset is conventionally positioned, to be removed therefrom when a call is to be initiated.

The user interface is coupled to apparatus 44 of an embodiment 20 of the present invention. The apparatus 44 is formed of functional elements implemented, for instance, by algorithms executable by control circuitry.

Here, a call establishment message generator 46 is coupled to the user interface to receive indications of off-hook indications indicated thereat. An off-hook indication is indicated when a telephonic station is taken off the hook switch when a user intends 5 to initiate a call with a terminating station. The call establishment message generator generates a call establishment message when the off-hook indication is provided thereto. The call establishment message is provided to the transmit circuitry 36 to be transmitted to the network infrastructure to inform the network infrastructure of the imminent request for establishment of a call with a terminating station.

The network infrastructure, here formed of both the base transceiver station 22 and access processor 32 is also shown to include both transmit circuitry and receive circuitry portions 52 and 54, respectively. The transmit and receive circuitry portions are implemented, for example, at the base transceiver station 22.

The call establishment message transmitted by the subscriber station to the network infrastructure is detected at the receive circuitry 52. Apparatus of an embodiment of the present invention, 20 here referenced at 56 is coupled to the receive and transmit circuitry 52 and 54. Elements forming the apparatus 56 are also functionally represented and can be implemented in any of various

manners, including by algorithms executable by control circuitry. And, the elements forming the apparatus 56 can be distributed at different locations of the network infrastructure or coupled thereto.

5 When a call establishment message is received at the receive circuitry, detection is made of its reception by a call establishment message detector 58. The call establishment message detector is coupled to a communication resource availability determiner 62. The communication resource availability determiner is operable at least responsive to detection of reception of the call establishment message at the network infrastructure. The communication resource availability determiner is operable to determine the availability of communication resources, both in the network 18 and upon the air interface 14, of communication resources to establish a call of indeterminate priority. Determinations are made, for instance, responsive to indications of other ongoing communication sessions with other subscriber stations as well as ongoing communication sessions making use of the network 18.

20 Determinations made by the determiner 62 are provided to a response generator 64. The response generator generates a response signal which is provide to the transmit circuitry 54. The response

signal is transmitted by way of the air interface 14 to the subscriber station 12. The response serves to acknowledge reception at the network infrastructure of the call establishment message and also to provide an indication to the subscriber station 5 of the availability of communication resources to establish a call originated at the subscriber station.

When the response is received at the receive circuitry 38 of the subscriber station, a response detector 68 detects reception at the subscriber station of the response. If the response indicates that communication resources are unavailable to establish a call, originated at the subscriber station, an indication is provided to a call set-up emulator 72. The call set-up emulator is operable to emulate normal operation of call set-up procedures even though the response indicates the communication resources to be unavailable to establish the call. The call set-up emulator includes, for instance, a dial tone generator which generates a conventional telephonic dial tone audibly detectable by a user of the telephonic station. Here, the oscillator 74 is representative of an oscillating signal used in the generation of a dial tone. The emulator is also coupled to the user interface 42 to receive indications of dialing digits or other actuator inputs input by way of the user interface. For instance when dialing digits are

entered, the generated dial tone is terminated and appropriate audibly-detectable tones are generated responsive to the entry of the dialing digits or other input actuations.

Indications of the entered dialing digits are also provided to 5 a dialing digit signal generator 76. The dialing signal generator generates a dialing digit signal which is provided to the transmit circuitry 36 to be transmitted to the network infrastructure.

When the dialing digit signal is received at the receive circuitry, detection of the signal is made by a dialing digit indication detector 82. The detector 82 detects the values of the dialing digits. Detection is at least made as to whether the values of the dialing digits are those corresponding to the emergency dispatch center, or other priority location. When detection is made of dialing digits corresponding to the emergency dispatch center, or other priority location, an indication of such is given to a resource reallocator 84. The resource reallocator is operable to reallocate the allocation of communication resources in the communication system to permit the establishment of the call between the subscriber station and the emergency dispatch center.

20 Resource reallocation caused to be effectuated by the resource reallocator includes, for instance, termination of ongoing communication sessions to make available the communication

resources to permit the call to the emergency dispatch center, or other priority location, to be established. Selection of which of the ongoing communication session, or sessions, to be terminated is made, for instance, upon random selection, or based upon 5 subscription service levels to which the different subscriber stations have subscribed.

Thereby, a call is able to be established between the subscriber station and the emergency dispatch center, even when the communication resources are not initially available to permit the establishment of the call. And, through the use of the call set-up emulator at the subscriber station, the originator of the call is not made aware of the initial unavailability of the communication resources.

Figure 3 again shows portions of the fixed wireless network, here shown at 300 of an embodiment of the present invention. The Fixed wireless network, is here show to include a subscriber integrated access device (SIAD) 304 located at a subscriber premises. The SIAD 304 includes radio circuitry 306 capable of transceiving radio signals. With a transceiver base station 308.

20 The radio circuitry 306 of the SIAD 304 is here capable of generating both voice and data packets, here represented by the blocks 312 and 314. The voice packets are representative of voice

packets generated during operation of a telephony handset which is operable in convention manner but connected to the radio circuitry of the SIAD.

The transceiver base station is coupled to an access processor 5 shelf 322 which here functionally is shown to include a table 324 at which active call information is stored, and a resource allocator 326 which allocates communication resources in the fixed wireless network.

10 The access processor communicates traffic and signaling information by way of the element 328 on the lines 332 with a network interface 334.

15 The network interface 334 is coupled to the PSTN/IP network 336.

The network 336 is, in tern, connected to a communication station, here located at an emergency dispatch center 338.

20 A telephony handset located at the SIAD 304 can be used, for instance, to phone an emergency request for emergency assistance to personnel at the emergency dispatch center. The call, when established, permits a call originator who places the call to request emergency assistance.

Due to the potentially emergency nature of the call, it is essential that the call be established. Due to the use of

concentration techniques in system construction, there is a possibility that system capacity would not permit establishment of the call, and the request for emergency assistance at the emergency dispatch center would not be completed.

5 During operation of an embodiment of the present invention, a manner is provided by which to better assure that the call is established.

Figure 4 illustrates a message sequence diagram, shown generally at 400, representative of operation of a fixed wireless network shown in Figure 3. Signaling is initiated at the SIAD 304 when a telephony handset is taken off-hook. As soon as the telephony handset is taken off-hook, a call establishment message is generated, indicated by the segment 404, and sent to the access processor 322. A determination is made as to whether resources are available to establish a call. In the exemplary scenario, resources are not available to establish a call, and an indication of the unavailability of the resources, indicated by the segment 406, is returned to the SIAD.

Upon receipt of the indication of the unavailability of the 20 resources, normal call set-up procedures are emulated, indicated by the block 408. Emulation procedures include, for instance, generation of a dial tone which is local to the SIAD but otherwise

appearing to be normal operation of the telephony handset to a user thereof. The user, upon detecting the dial tone, dials, or otherwise enters, digits associated with the emergency dispatch center, such as the emergency digits 9-1-1 forming a pseudo universal emergency number in the United States. The entered digits of the dialing code are captured, indicated at the block 410, and a digit message is generated and transmitted by the segment 412 to the access processor 322.

At the access processor a determination is made as to whether the values of the digits contain in the digit message are associated with the emergency dispatch center or are otherwise associated with the priority call. If not, a terminate call message indicated by the segment 414 is returned to the SIAD. A terminate call message is identified at the telephony handset at the SIAD as a fast busy signal.

If, conversely, the digit message is of values corresponding to an emergency dispatch center, or is otherwise representative of a priority call, a decision is made to permit the establishment of the call. To free resources to permit the establishment of the call, a nonpriority call is terminated, indicated by the block 416.

A non priority call is terminated, such as by randomly terminating an active call selected from the table 324, (shown in Figure 3). A

priority might also be associated with the act of calls, and a lowest-priority act of call is first-terminated. Or, a random termination of a lowest-priority call is performed. Thereby, resources are made available to establish the call between the 5 telephony handset and the emergency dispatch center. Thereafter, and as indicated by the segment 418, a message is sent to the PSTN to cause a call to be established therethrough. Normal call operations, indicated by the block 422 is thereafter effectuated at the 911, or other priority call, continues until one side, or the other, of the communication sessions goes on-hook.

The previous descriptions are of preferred examples for implementing the invention, and the scope of the invention should not necessarily be limited by this description. The scope of the present invention is defined by the following claims.